EURASIAN EXPERIMENT JOURNAL OF SCIENTIFIC AND APPLIED RESEARCH
(EEJSAR) ISSN: 2992-4146
©EEJSAR Publications Volume 7 Issue 1

Precision Public Health: Using Data to Tailor Interventions

Mugisha Emmanuel K.

Faculty of Science and Technology Kampala International University Uganda

ABSTRACT

Precision Public Health (PPH) is revolutionizing traditional public health strategies by utilizing data-driven methodologies to tailor interventions at individual and subgroup levels. By integrating epidemiology, data science, and sociology, PPH enhances health predictions and intervention effectiveness. The field relies on diverse data sources, including electronic health records, digital health platforms, and wearable technologies, to improve real-time decision-making. Advanced analytics, such as machine learning and predictive modeling, further refine health strategies by identifying risk patterns and optimizing personalized interventions. However, ethical challenges must be addressed to ensure responsible implementation, including data privacy, informed consent, and health equity concerns. This paper examines the role of PPH in enhancing public health outcomes while navigating the challenges of data integration and ethical considerations.

Keywords: Precision Public Health, Data Analytics, Predictive Modeling, Health Disparities, Machine Learning, Digital Health, Epidemiology.

INTRODUCTION

The term "Precision Public Health" is tailoring public health interventions to individuals or population subgroups using data. In Precision Public Health, predictions generated from public health data are used to inform the design of public health interventions most likely to be efficacious for someone. In this new field, health is measured in more than just traditional terms, and data capable of predicting health outcomes are utilized. Different scientific disciplines are integrated to examine health and the data, including but not limited to: sociology, epidemiology, and data science. There is a long history of utilizing data to design precision interventions in the field of mathematics and education, for example, as seen in the "Red Belt" example from 2009. However, it was not until the concept was described in The Lancet in 2015 that this idea jumped into contemporary public health purview. As the data and support for the Precision Public Health framework continue to grow, the more it is hoped it can help to catalyze a fascinating transformation of public health practice and advance its progress in general. There are several tenets of the Precision Public Health framework. The Precision Public Health process first describes ways of conceptualizing health, highlighting the importance of measuring health in multiple ways. It then lays out a framework for utilizing data in public health practice. This framework suggests public health can implement its practice to be more experimental, focusing on predicting the health impacts of potential interventions before testing them. If such potential health impacts can be predicted for a population, then interventions can be chosen (or designed if they do not exist) with health outcomes in mind that are predicted from data. This is a change from usual public health practice. Interventions are normally chosen based on population-level needs or require individuals to self-identify, instead of being more freely available to those that may need them. The last part of the framework then describes ways of making interventions more accessible for individuals or subgroups that may benefit from them, integrating public health intervention design with their usual practice of policy dissemination or other intervention implementation [1, 2].

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

Definition and Conceptual Framework

Current conceptualizations of Precision Public Health focus on delivering appropriate interventions to the right population at the right time, employing new methods for measuring diseases and health factors. Big data and informatics are pivotal, with data usage often seen as central to this approach. However, these ideas connect to a broader framework that involves models of genetics, environment, behavior, and health, along with strategies for advancing research and policy for tailored interventions. Population stratification is a key goal, leveraging advanced technologies and big data to promote health through these tailored methods. The application of technology addresses (1) etiology and mechanistic research, (2) health policy development and evaluation, and (3) targeted deployment of interventions. Examples illustrate how this innovative method enhances public health decision-making and influences policy changes. This evolving paradigm has significant implications for public health initiatives, with literature from 'omics' fields providing foundational principles and priorities applicable across informatics contexts, crucial for analyzing specific data sources within Precision Public Health [3, 4].

Historical Context and Evolution

Precision Public Health represents both a modern focus and an evolution of public health concepts, tracing its roots to traditional public health ideas. Over time, the approach shifted from viewing health as a public good to personalized interventions that consider genetic factors, lifestyle, and environmental influences. Key milestones in PPH are marked by a transition from generic, population-wide prevention strategies to tailored, individualized health interventions based on specific risk profiles. The evolution reflects advancements in population monitoring technologies, from ancient boundary markers to contemporary biosensors and IoT devices. Significant public health milestones over the last century highlight changing collective health interventions and population monitoring methods. These technological advancements have altered how health interventions are developed and executed. Influential case studies provide insight into public health history and disease control approaches, showcasing methods and techniques that have been influenced by broader socio-economic transformations. These shifts in public health reflect an increasing recognition of the diverse health needs of various population subgroups, shaped by their social, environmental, and occupational contexts. This awareness links historical developments in health strategies with the current challenges faced in implementing PPH, illustrating the significance of understanding the interplay between environmental risk factors and health outcomes in modern public health discourse [5, 6].

Data Sources in Precision Public Health

Precision public health is a data-driven approach aimed at enhancing population health through tailored, context-specific interventions informed by data. To succeed, it must harness rapidly growing data streams and advanced technologies capable of processing and interpreting this data. Critical data sources for PPH involve traditional elements like health records, vital statistics, drug prescription trends, surveys, syndromic surveillance, spatial data, and census data, which offer estimations of population and sociodemographic health determinants. However, these sources lag behind real-world advancements in both the datasets and analysis methods, particularly amid challenges such as climate change, pandemics, and personalized health care, limiting their effectiveness in addressing urgent public health issues. Emerging data streams fall into two categories: novel, innovative sources that may provide proxy signals of disease and common data streams utilized in creative new ways. The latter, especially when combined, can deliver transformative insights. Nonetheless, ethical concerns must be addressed, particularly regarding privacy and data ownership, and it remains uncertain how these diverse data types can be integrated into a comprehensive framework. The variety in data formats necessitates significant preprocessing for exploratory analysis, warranting a review of PPH integration methods in epidemiology literature to emphasize interoperability as a crucial objective. Lastly, ensuring the quality of data sources is essential, with ongoing discussions about managing bias and establishing metrics to guarantee data quality in public health initiatives [7, 8].

Traditional Sources

Public health has heavily relied on systematic data collection, primarily from hospital records, health surveys, and government databases. These structured, reliable data sets are vital for monitoring health outcomes and disease spread, forming the basis for epidemiological insights on populations. Timeliness and structure make this data crucial for health planners, especially during crises when waiting for comprehensive data is impractical. While concerns about data quality have arisen, the refinement of data reliability has accompanied its growth. The retrospective nature of data limits the comprehensive

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

understanding of events, often misaligning with the needs of target populations. The variability in data quality complicates public health initiatives. However, a valuable contemporary approach combines older and newer data sets, particularly concerning individualized risk profiles and environmental exposures. In the context of suicide, this strategy reveals significantly higher overdose death rates, showcasing gender disparities previously underestimated. Community-public health collectives emerging outside official departments exhibit strong capabilities in creating rigorous data methodologies that rival traditional public health efforts [9, 10].

Novel Data Streams

The ethical dimension of technological developments must be central to stakeholders' actions as clinicians, academics, public health communities, and regulators engage with emerging digital data. New sources of data from online platforms and smart technology offer public health innovative ways to leverage non-traditional information streams. This evolution allows for advanced capabilities in data capture, analysis, and evaluation. Precision Public Health is a forward-looking vision aiming to provide timely, targeted interventions based on individual and environmental health determinants, with insights gained from diverse data analytics. The conversation around data perspectives is ongoing, extending beyond remote monitoring and machine-generated datasets toward encompassing broad public discourse as mobile apps and wearables proliferate. Healthy data can be captured from both beneficial and harmful platforms that track health indicators. Machine learning transforms vast amounts of cyberspace into actionable health information, capturing experiences often overlooked by traditional health datasets. This presents an opportunity to change perspectives on health issues by gathering user-reported data, but it also risks excluding those without digital access and introducing bias. Concerns about data quality, privacy, and ethical usage of health information are increasingly voiced among healthcare practitioners and researchers as innovation advances. To effectively incorporate new data streams into public health strategies, robust frameworks are necessary. The following examples illustrate the modern data sources shaping the goals of Precision Public Health [11, 12].

Data Analytics and Machine Learning in Precision Public Health

Data analytics and machine learning technologies have become essential to modern health practice and research, particularly in the transition from genome-based precision medicine to data-diverse precision public health. These technologies promise the discovery of actionable knowledge and insights from vast data resources that can guide the development and evaluation of a myriad of innovative interventions to address the enormous heterogeneity of goals and responsibilities in health. The objectives of precision public health also require the identification of large numbers of novel and unexpected targets for surveillance and intervention that are present and sometimes blatantly obvious in the infrequent variant subgroups and have been missed by the widespread application of univariate analyses. Keeping sight of the ultimate objectives of the technologies can result in very precise and highly actionable insights that justify the extensive resources required for their development and application. Ongoing evidence and demonstration of these insights could help in gaining public trust, investment, and regulatory permissions for the further development and extension of precision public health applications. This paper reviews the current capabilities and limitations of big data analytics and machine learning technologies for precision health and outlines some of the research strategies for their advancement and application in precision public health to achieve the impacts intended by the application of these widely hyped technologies to the broader goals of health and the novel targets of precision public health. Basic terms and the gestation fail safety paradigm are used to clarify critical distinctions between data and actionable knowledge and between the true and naive objectives of big data analytics, predictive modeling, and computer simulation technologies. These technologies are indispensable for exploring the vastly multidimensional search space of data-driven analyses and interventions, but their embodiments and application to data-driven public health can only provide accounts and explanations of the causal structures and mechanisms of biobehavioral systems required for effective intervention [13, 14].

Descriptive Analytics

Descriptive analytics is essential in precision public health, offering a way to aggregate historical data to identify relevant trends and patterns. Its primary aim is to derive data-driven insights across various levels, from individual incidents to broader populations within specific geographical and temporal contexts. The outcomes of descriptive analysis support recommendations and help visualize results, facilitating clearer communication with stakeholders who may lack expertise. Visualization tools aid public health practitioners in quicker risk identification and understanding of health determinants.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

Focused infographics summarize key indicators like incidence and prevalence rates over time, while epidemiological surveys utilize visual aids to present distributions and determinants of health conditions, guiding public health recommendations. However, descriptive analytics cannot establish causality or predict future outcomes; its role extends to evaluation and formulating strategies for public crafting. Ultimately, descriptive analytics contributes to informed scientific decision-making, illustrated by several practical examples demonstrating its effectiveness in enhancing understanding and supporting evidence-based approaches [15, 16].

Predictive Analytics

Local health departments are consuming and producing volumes of data as never before. Through the vast networks of interconnected electronic health records, integrated case management systems, and electronic lab reporting, information on the health of communities flows rapidly. These sources are being joined by others, such as social media posts, search engine queries, and even sensors on people and in homes and public spaces that are joining the incoming data deluge. Precision health is intended to ensure that the right preventive or therapeutic interventions can be employed at the moment of greatest effect. The full capacity and promise of precision health will not be realized without precision public health, a complementary approach that scales these interventions to populations and underpins them with open systems that generate the data needed for their accurate prediction. Both precision health and the precision public health enterprises depend on technologies that recently arrived in the domains of health and human services generally, and especially so in the realm of public health. Key among the transformative tools of these two new approaches are data analytics and machine learning. These computational methods together provide a potent analytical toolkit capable of describing events, making predictions, and suggesting optimal courses of action for a wide range of real-world problems of relevance to human health [17, 18].

Prescriptive Analytics

Predictive analytics links outcomes with individual characteristics, while prescriptive analytics explores treatment options, recommending those that may prompt behavior change, regardless of predictive bases. It generates personalized, evidence-informed insights that promote health improvements and support decision-making in public health programs. A new stochastic machine learning model for dose-response health benefits aims to refine physical activity guidelines. Given individual differences in guidelines, prescriptive analytics focuses on describing behavior change effectively. In binary machine learning models, sensitive individuals' behavior change isn't captured, and median predictive performance is inadequate. To detail health benefit guidelines, a statistical stochastic machine learning framework called classification distribution regression is employed. This model utilizes the sensitive curve to represent individual probabilities for necessary doses, capturing the health benefit probability distribution as a percentage of weekly doses, thus defining the dose needed for specific benefit thresholds [19, 20].

Ethical Considerations in Precision Public Health

Precision Public Health employs innovative strategies to deliver effective health solutions for individuals and communities by using refined models to uncover trends and disparities linked to social determinants of health. For instance, it can reveal areas with high lead poisoning incidences, allowing for timely preventative measures. Such initiatives are essential for fostering an inclusive health system, but implementing them without community input may exacerbate existing disparities. Additionally, ethical dilemmas arise regarding data privacy and informed consent; maintaining individual data rights against group benefits poses challenges. Public trust in privacy must be prioritized, as data misuse can lead to trust erosion and severe consequences, such as insurance premium hikes due to 'pre-existing conditions' classifications. Medical data could potentially be exploited for commercial studies, risking personal harm to participants. Thus, it is vital to ensure effective anonymization of collected data and to critically assess any attempts to link datasets to prevent privacy violations [21, 22].

Case Studies in Precision Public Health

A fundamental goal in public health is to pursue evidence-based interventions for improving community health and promoting equity. The emergence of Precision Public Health is shifting focus toward tailored applications of diverse data sources to create individualized interventions. This has led to innovative public health programs, policies, and technologies that utilize sensor data on behaviors and exposures, machine learning algorithms, and rapid response capabilities. Case studies illustrate the successful adaptation of real-world interventions to new data streams, particularly in monitoring infectious diseases through real-time data on outbreaks, which allows timely detection in populations often underserved by

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

healthcare providers, like those relying on telemedicine. One system optimizes response strategies using data-driven simulations, proving effective containment. Additionally, MDAM-based methods can be adapted for chronic disease management, allowing personalized intervention plans based on biomarker measures. Health policies can also benefit from analyzing insurance claims data to improve cardiovascular prevention, offering clear advantages for low-income participants. The program targeting diabetic patients highlights the potential of integrating various data sources, such as medical records and lifestyle data, to develop personalized risk assessments and messaging campaigns. However, regulations can hinder the implementation of innovative health data systems, marking a significant evolution in best practices regarding data management. These case studies exemplify a range of strategies for integrating Big Data into public health, addressing multiple diseases with innovative approaches, and offering valuable insights for future Precision Public Health initiatives [23, 24].

Infectious Disease Surveillance

Infectious disease surveillance illustrates how data-driven approaches aid public health responses. Selected examples showcase situations where significant epidemiologic work provided crucial information, even when preparedness was lacking. On April 20, Peru's MOH's TeleSalud noted a rise in acute gastrointestinal illness in La Oroya, where a philanthropic hospital operated. An investigation revealed the likely exposure occurred from hospital water. A subsequent case-control study indicated a high odds ratio of 27 for illness linked to this water source. Testing showed contamination from Campylobacter jejuni in samples from both the hospital and a nearby cistern. As a result, the hospital ceased water service, effectively ending the outbreak and leading to its closure. Developing skills with new data sources can enhance information gathering, decreasing the chances of missing essential details in real-time events. Evidence stems from case studies and other relevant occurrences outside the project's timeline.

Implementation Challenges and Solutions

Overcoming ethical and social stigma to mitigate effects on outcomes requires creative, context-specific solutions. With community partners having competing priorities, it's vital to clarify how big data techniques enhance population health and emphasize community engagement to avoid mistrust and negative experiences for newcomers. Precision public health programs necessitate community involvement from the outset; building interest and trust fosters program uptake and improves outcomes. Risk can be mitigated through plain language and training for those securing informed consent in big data projects to address common questions. When data is drawn only from clinic visits, some communities may develop ways to evade health department tracking, leading to untreated individuals amplifying risky behaviors. Those overlooked by outreach workers are costly to locate yet most in need of effective programs reliant on public health surveillance data. Implementing programs solely for those who accessed care is stigmatizing, especially when government responses focus only on previously identified individuals. To increase effectiveness and lower stigma, it's crucial to identify the extent of missed cases, presenting a challenge that can be partially tackled using public data creatively. Public health experts must innovate to find and utilize effective data sources for big data methods. In the digital age, precision public health approaches are more likely to succeed when supported by technologies that enable community engagement, while ensuring big data use does not reinforce societal inequities [25, 26, 27].

Future Directions and Emerging Technologies

Precision Public Health leverages new technologies and data sources to tackle public health issues. Research and practitioner communities are increasingly using advancements in artificial intelligence, big data, and machine learning to transform public health methodologies. These tools signal a shift in how public health is understood and practiced. Predictive modeling, which estimates outcomes based on data features, is becoming prevalent in areas like epidemic forecasting and analyzing social determinants of health. The growth of diverse data sources—like satellite networks, social media, and probiotics—enhances predictive modeling by incorporating unconventional public health data. This fosters research output and democratizes tool development for data-driven public health decision-making. As research methods evolve, future practitioners should critically assess sleek proprietary platforms claiming comprehensive predictive capabilities. Instead, they are encouraged to engage deeply with available resources, software, frameworks, and libraries since human inquiry aligns better with tailored problem contexts. Generally, predictive inquiries important for effective public health intervention fall within health research and epidemiology; however, significant exploration opportunities remain. Potential areas

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

of focus include disease etiology, epidemic control, access to preventive healthcare, and evaluating large-scale public health interventions like tobacco regulations. Additional interventions may involve assessing community factors like local food environments in food security studies or exploring place characteristics that may predict police violence. Ultimately, developing innovative, data-centric estimates for testing and collaboration with relevant disease-specific communities is crucial [13, 28, 29, 30].

CONCLUSION

Precision Public Health represents a transformative approach to improving public health outcomes by utilizing data-driven insights to design targeted interventions. By integrating traditional and digital data sources with advanced analytics, PPH enhances predictive capabilities, optimizes healthcare resources, and supports personalized health strategies. However, ethical considerations such as data privacy, equity, and informed consent must be carefully managed to prevent unintended consequences. The future of PPH lies in balancing technological advancements with ethical responsibility, ensuring that data-driven interventions promote equitable and effective public health solutions.

REFERENCES

1. Roberts MC, Fohner AE, Landry L, Olstad DL, Smit AK, Turbitt E, Allen CG. Advancing precision public health using human genomics: examples from the field and future research opportunities. Genome medicine. 2021 Jun 1;13(1):97. springer.com
2. Velmovitsky PE, Bevilacqua T, Alencar P, Cowan D, Morita PP. Convergence of precision medicine and public health into precision public health: toward a big data perspective. Frontiers in Public Health. 2021 Apr 6;9:561873. frontiersin.org
3. Evans RE, Moore G, Movsisyan A, Rehfuess E. How can we adapt complex population health interventions for new contexts? Progressing debates and research priorities. J Epidemiol Community Health. 2021 Jan 1;75(1):40-5. bmj.com
4. Khoury MJ, Bowen S, Dotson WD, Drzymalla E, Green RF, Goldstein R, Kolor K, Liburd LC, Sperling LS, Bunnell R. Health equity in the implementation of genomics and precision medicine: a public health imperative. Genetics in Medicine. 2022 Aug 1;24(8):1630-9. sciencedirect.com
5. Viana JN, Edney S, Gondalia S, Mauch C, Sellak H, O'Callaghan N, Ryan JC. Trends and gaps in precision health research: a scoping review. BMJ open. 2021 Oct 1;11(10):e056938. bmj.com
6. Franks PW, Cefalu WT, Dennis J, Florez JC, Mathieu C, Morton RW, Ridderstråle M, Sillesen HH, Stehouwer CD. Precision medicine for cardiometabolic disease: a framework for clinical translation. The Lancet Diabetes & Endocrinology. 2023 Nov 1;11(11):822-35. [HTML]
7. Wang Z, Xiong H, Zhang J, Yang S, Boukhechba M, Zhang D, Barnes LE, Dou D. From personalized medicine to population health: a survey of mHealth sensing techniques. IEEE Internet of Things Journal. 2022 Mar 22;9(17):15413-34. [PDF]
8. Bandi M, Masimukku AK, Vemula R, Vallu S. Predictive Analytics in Healthcare: Enhancing Patient Outcomes through Data-Driven Forecasting and Decision-Making. International Numeric Journal of Machine Learning and Robots. 2024;8(8):1-20.
9. Grindell C, Coates E, Croot L, O'Cathain A. The use of co-production, co-design and co-creation to mobilise knowledge in the management of health conditions: a systematic review. BMC Health Services Research. 2022 Jul 7;22(1):877. springer.com
10. Osman W, Mohamed F, Elhassan M, Shoufan A. Is YouTube a reliable source of health-related information? A systematic review. BMC medical education. 2022 May 19;22(1):382.
11. Khoury MJ, Holt KE. The impact of genomics on precision public health: beyond the pandemic. Genome medicine. 2021 Apr 23;13(1):67.
12. Naithani N, Sinha S, Misra P, Vasudevan B, Sahu R. Precision medicine: Concept and tools. medical journal armed forces india. 2021 Jul 1;77(3):249-57. nih.gov
13. Ali H. AI for pandemic preparedness and infectious disease surveillance: predicting outbreaks, modeling transmission, and optimizing public health interventions. Int J Res Publ Rev. 2024 Aug;5(8):4605-19.
14. Li W, Chai Y, Khan F, Jan SR, Verma S, Menon VG, Kavita F, Li X. A comprehensive survey on machine learning-based big data analytics for IoT-enabled smart healthcare system. Mobile networks and applications. 2021 Feb;26:234-52. springer.com
15. Ongesa TN, Ugwu OP, Ugwu CN, Alum EU, Eze VH, Basajja M, Ugwu JN, Ogenyi FC, Okon MB, Ejemot-Nwadiaro RI. Optimizing emergency response systems in urban health crises: A

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

project management approach to public health preparedness and response. Medicine. 2025 Jan 17;104(3):e41279.

16. Ivanković D, Barbazza E, Bos V, Brito Fernandes Ó, Jamieson Gilmore K, Jansen T, Kara P, Larrain N, Lu S, Meza-Torres B, Mulyanto J. Features constituting actionable COVID-19 dashboards: descriptive assessment and expert appraisal of 158 public web-based COVID-19 dashboards. Journal of medical Internet research. 2021 Feb 24;23(2):e25682. jmir.org
17. Amini M, Zayeri F, Salehi M. Trend analysis of cardiovascular disease mortality, incidence, and mortality-to-incidence ratio: results from global burden of disease study 2017. BMC public health. 2021 Dec;21:1-2.
18. De Boer IH, Alpers CE, Azeloglu EU, Balis UG, Barasch JM, Barisoni L, Blank KN, Bomback AS, Brown K, Dagher PC, Dighe AL. Rationale and design of the kidney precision medicine project. Kidney international. 2021 Mar 1;99(3):498-510. nih.gov
19. Alowais SA, Alghamdi SS, Alsuhebany N, Alqahtani T, Alshaya AI, Almohareb SN, Aldairem A, Alrashed M, Bin Saleh K, Badreldin HA, Al Yami MS. Revolutionizing healthcare: the role of artificial intelligence in clinical practice. BMC medical education. 2023 Sep 22;23(1):689. springer.com
20. Turimov Mustapoevich D, Kim W. Machine learning applications in sarcopenia detection and management: a comprehensive survey. InHealthcare 2023 Sep 7 (Vol. 11, No. 18, p. 2483). MDPI.
21. Ugwu CN, Ugwu OP, Alum EU, Eze VH, Basajja M, Ugwu JN, Ogenyi FC, Ejemot-Nwadiaro RI, Okon MB, Egba SI, Uti DE. Sustainable development goals (SDGs) and resilient healthcare systems: Addressing medicine and public health challenges in conflict zones. Medicine. 2025 Feb 14;104(7):e41535.
22. Wang E, Shuryak I, Brenner DJ. A competing risks machine learning study of neutron dose, fractionation, age, and sex effects on mortality in 21,000 mice. Scientific Reports. 2024 Aug 2;14(1):17974.
23. Nancy AA, Ravindran D, Raj Vincent PD, Srinivasan K, Gutierrez Reina D. Iot-cloud-based smart healthcare monitoring system for heart disease prediction via deep learning. Electronics. 2022 Jul 22;11(15):2292. mdpi.com
24. Marques L, Costa B, Pereira M, Silva A, Santos J, Saldanha L, Silva I, Magalhães P, Schmidt S, Vale N. Advancing precision medicine: a review of innovative in silico approaches for drug development, clinical pharmacology and personalized healthcare. Pharmaceutics. 2024 Feb 27;16(3):332. mdpi.com
25. Hassan M, Awan FM, Naz A, deAndrés-Galiana EJ, Alvarez O, Cernea A, Fernández-Brillet L, Fernández-Martínez JL, Kloczkowski A. Innovations in genomics and big data analytics for personalized medicine and health care: a review. International journal of molecular Sciences. 2022 Jan;23(9):4645. mdpi.com
26. Edyedu I, Ugwu OP, Ugwu CN, Alum EU, Eze VH, Basajja M, Ugwu JN, Ogenyi FC, Ejemot-Nwadiaro RI, Okon MB, Egba SI. The role of pharmacological interventions in managing urological complications during pregnancy and childbirth: A review. Medicine. 2025 Feb 14;104(7):e41381.
27. Johnson KB, Wei WQ, Weeraratne D, Frisse ME, Misulis K, Rhee K, Zhao J, Snowdon JL. Precision medicine, AI, and the future of personalized health care. Clinical and translational science. 2021 Jan;14(1):86-93. wiley.com
28. Lal A, Ashworth HC, Dada S, Hoemeke L, Tambo E. Optimizing pandemic preparedness and response through health information systems: lessons learned from Ebola to COVID-19. Disaster medicine and public health preparedness. 2022 Feb;16(1):333-40. cambridge.org
29. Johnson-Agbakwu CE, Ali NS, Oxford CM, Wingo S, Manin E, Coonrod DV. Racism, COVID-19, and health inequity in the USA: a call to action. Journal of racial and ethnic health disparities. 2022 Feb 1:1-7. springer.com
30. Zhao Y, Wood EP, Mirin N, Cook SH, Chunara R. Social determinants in machine learning cardiovascular disease prediction models: a systematic review. American journal of preventive medicine. 2021 Oct 1;61(4):596-605. sciencedirect.com

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

CITE AS: Mugisha Emmanuel K. (2025). Precision Public Health: Using Data to Tailor Interventions. EURASIAN EXPERIMENT JOURNAL OF SCIENTIFIC AND APPLIED RESEARCH, 7(1): 78-85.

.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited